

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A replaceable pressure sensor insert adapted for removable connection with an  
5 insert carrier comprising:
  - (a) a housing, wherein the housing defines an exterior of the housing and wherein the housing defines an interior of the housing;
  - 10 (b) a pressure sensor connected with the housing such that the pressure sensor is capable of sensing an ambient pressure at the exterior of the housing;
  - (c) an electronics assembly contained within the interior of the housing and electrically connected with the pressure sensor;
  - 15 (d) a first insert mounting component adapted to be removably connectable with a second insert mounting component associated with the insert carrier in order to facilitate connection and replacement of the insert;
  - 20 (e) a housing sealing mechanism for sealing the insert relative to the insert carrier; and
  - (f) a sensor sealing mechanism for sealing the pressure sensor relative to the housing.
2. The insert as claimed in claim 1 wherein the electronics assembly is comprised of a  
25 processor for processing data received from the pressure sensor.
3. The insert as claimed in claim 1 wherein the electronics assembly is comprised of a memory for storing data generated by the insert.
- 30 4. The insert as claimed in claim 1 wherein the pressure sensor is comprised of a sensing end for sensing the ambient pressure at the exterior of the housing, wherein the pressure

sensor is further comprised of a connecting end for electrically connecting the pressure sensor with the electronics assembly, and wherein the connecting end of the pressure sensor is in communication with the interior of the housing in order to facilitate the electrical connection of the pressure sensor and the electronics assembly.

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5. The insert as claimed in claim 4 wherein the pressure sensor defines an exterior of the pressure sensor, wherein the pressure sensor defines an interior chamber of the pressure sensor, wherein the sensing end of the pressure sensor is comprised of a diaphragm for transmitting the ambient pressure from the exterior of the pressure sensor to the interior chamber of the pressure sensor, and wherein the diaphragm is in communication with the exterior of the housing so that the ambient pressure at the exterior of the housing is transmitted to the interior chamber of the pressure sensor.

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6. The insert as claimed in claim 5 wherein the pressure sensor is further comprised of a sidewall surrounding the interior chamber of the pressure sensor, wherein the sidewall is comprised of an exterior surface, and wherein the insert is configured so that at least a portion of the ambient pressure is exerted on the exterior surface of the sidewall in order to provide a balancing of pressure between the exterior surface of the sidewall and the interior chamber of the pressure sensor.

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7. The insert as claimed in claim 6 wherein the housing is comprised of a sensor mount which defines a sensor bore for accepting the pressure sensor, wherein the sensor mount is comprised of a sensor bore wall surrounding the sensor bore, and wherein the pressure sensor is positioned within the sensor bore.

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8. The insert as claimed in claim 7 wherein the insert is comprised of a first insert end and a second insert end, wherein the sensing end of the pressure sensor is located adjacent to the first insert end, wherein the interior chamber of the pressure sensor is comprised of a distal chamber end adjacent to the sensing end of the pressure sensor, wherein the interior chamber of the pressure sensor is further comprised of a proximal chamber end, and wherein the proximal

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chamber end is located between the first insert end and at least one of the housing sealing mechanism and the sensor sealing mechanism.

9. The insert as claimed in claim 8 wherein the sidewall of the interior chamber of the pressure sensor is substantially contained within the sensor bore.

10. The insert as claimed in claim 9 wherein the sensor bore wall is comprised of a deformable sensor bore wall.

11. The insert as claimed in claim 10 wherein the sensor sealing mechanism is located adjacent to the first insert end.

12. The insert as claimed in claim 11 wherein the sensor sealing mechanism is comprised of a weld between the pressure sensor and the deformable sensor bore wall.

13. The insert as claimed in claim 12 wherein the housing sealing mechanism is comprised of a metal seal.

14. The insert as claimed in claim 13 wherein the sidewall of the interior chamber of the pressure sensor has a sidewall thickness, wherein the deformable sensor bore wall has a deformable sensor bore wall thickness, and wherein the deformable sensor bore wall thickness is approximately less than or equal to the sidewall thickness.

15. The insert as claimed in claim 8, further comprising an electrical connector for electrically connecting the insert with an electrical power source.

16. The insert as claimed in claim 15 wherein the electrical connector is located adjacent to the second insert end.

17. The insert as claimed in claim 8 wherein the proximal chamber end is located between the first insert end and the first insert mounting component.

18. The insert as claimed in claim 17 wherein the first insert mounting component is comprised of an insert threaded section associated with the housing which is adapted for threaded engagement with the second insert mounting component in order to removably connect the insert with the insert carrier.

19. The insert as claimed in claim 18 wherein the insert threaded section is comprised of a projecting flange associated with the housing and wherein the insert threaded section is further comprised of a thread formed in the projecting flange.

20. The insert as claimed in claim 17 wherein the housing sealing mechanism is located between the first insert end and the first insert mounting component.

21. The insert as claimed in claim 20 wherein the first insert mounting component is comprised of an insert threaded section associated with the housing which is adapted for threaded engagement with the second insert mounting component in order to removably connect the insert with the insert carrier.

22. The insert as claimed in claim 21 wherein the insert threaded section is comprised of a projecting flange associated with the housing and wherein the insert threaded section is further comprised of a thread formed in the projecting flange.

23. The insert as claimed in claim 17 wherein the sensor sealing mechanism is located between the first insert end and the first insert mounting component.

24. The insert as claimed in claim 23 wherein the insert is configured so that the insert is connected with the insert carrier by advancing the insert relative to the insert carrier in a direction toward the first insert end and wherein the insert is configured so that the insert is disconnected from the insert carrier by retreating the insert relative to the insert carrier in a direction toward the second insert end.

25. The insert as claimed in claim 24 wherein the first insert mounting component is comprised of an insert threaded section associated with the housing which is adapted for threaded engagement with the second insert mounting component in order to removably connect the insert with the insert carrier.

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26. The insert as claimed in claim 25 wherein the insert threaded section is comprised of a projecting flange associated with the housing and wherein the insert threaded section is further comprised of a thread formed in the projecting flange.

10 27. The insert as claimed in claim 25, further comprising a tool engagement surface located adjacent to the second insert end which is adapted to engage a tool for advancing and retreating the insert relative to the insert carrier.

15 28. The insert as claimed in claim 27 wherein the tool engagement surface is comprised of a hexagonal surface which is adapted to engage a wrench.